What is claimed is:

1. An oral care composition for whitening teeth comprising:

a peroxyacetic acid generating mixture including a source of peroxide and source of labile acyl groups, wherein the source of labile acyl groups is a C_1-C_5 molecule having between 1 to 5 labile C_1-C_5 acyl containing groups dispersed within an anhydrous carrier.

2. The composition of claim 1 wherein the source of labile acyl groups is a C_1-C_3 molecule having 1, 2, or 3 labile acetyl groups.

3. The composition of claim 1 wherein the source of labile acyl groups is selected from the group consisting of glyceryl triacetate, glyceryl diacetate and glyceryl acetate.

4. A composition according to claim 1, wherein the source of peroxide is selected from the group consisting of carbamide peroxide, sodium percarbonate, sodium perborate, calcium peroxide, magnesium peroxide, sodium peroxide, and anhydrous poly(vinyl pyrrolidone) / hydrogen peroxide complexes.

5. A composition according to claim 1 capable of providing an oral pH of more than 5.0 to generate peroxyacetic acid.

6. A composition according to claim 5, wherein the oral pH is 7.8.

7. The composition of claim 1 further including a carrier.

8. The composition of claim 7 wherein the carrier is selected from the group consisting of glycerin, propylene glycol, polyethylene glycols, chewing gum and gum base products, floss carriers and floss wax products, oils, waxes and esters.

9. The composition of claim 1 further comprising a thickening agent.

10. The composition of claim 9 wherein the thickening agent is selected from the group consisting of neutralized carboxypolymethylene, polyacrylic acid polymers and copolymers, hydroxypropylcellulose and other cellulose ethers, salts of poly(methyl vinyl ether-co-maleic anhydride), poly(vinylpyrrolidone), poly(vinylpyrrolidone-co-vinyl acetate), silicon dioxide, fumed silica, and stearic acid esters,

11. The composition of claim 1 further comprising a buffer.

12. The composition of claim 11 wherein the buffer is selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide, sodium phosphate di- and tri-basic, potassium phosphate di- and tri-basic, sodium tripolyphosphate, tris(hydroxymethyl)aminomethane, triethanolamine, polyethylenimine, polyacrylic acid, poly(methyl vinyl ether-co-maleic anhydride), citric acid, and phosphoric acid.

13. The composition of claim 1 further comprising a surfactant.

14. The composition of claim 13 wherein the surfactant is selected from the group consisting of zwitterionic and fluorinated surfactants.

15. The composition of claim 1 further comprising a chelating agent.

16. The composition of claim 15 wherein the chelating agent is selected from the group consisting of phosphonic acids, EDTA, and polyphosphates.

17. The composition of claim 1 further comprising flavorants or sweeteners.

18. A composition for producing peroxyacetic acid for use in whitening teeth, the composition comprising a two component system including:

a first component including a hydrogen peroxide releasing compound and

a second component including glyceryl triacetate.

19. A method for whitening teeth comprising:

forming a composition by combining a hydrogen peroxide precursor, glyceryl triacetate, and water so as to generate peroxyacetic acid; and

applying the composition to a tooth surface.

20. A method for whitening teeth comprising:

applying one of either a glyceryl triacetate or a hydrogen peroxide releasing compound onto a tooth surface; and

applying the other of the remaining glyceryl triacetate or hydrogen peroxide releasing compound onto the same tooth surface, so as to generate peroxyacetic acid upon contact with an aqueous solution on the surface of the tooth.

21. A method for whitening teeth comprising:

providing separately glyceryl triacetate and a hydrogen peroxide releasing compound, both in an orally safe and sufficient amount for whitening teeth;

forming a mixture between the glyceryl triacetate and the hydrogen peroxide releasing compound; and

applying the mixture onto a tooth surface.

22. A method for cosmetically treating teeth comprising the steps of:

applying a source of labile acetyl groups onto the surface of a tooth;

allowing the source of labile acetyl groups to penetrate into the tooth;

applying a source of peroxide onto the surface of the tooth;

allowing the source of labile acetyl groups to react with the source of peroxide anion to generate a peroxyacid within the tooth; and

allowing the peroxyacid to effect whitening of the tooth.

23. The method of claim 22 wherein the source of labile acetyl groups is a C_1-C_5 molecule having between 1 to 5 labile C_1-C_5 acyl containing groups.

24. The method of claim 22 wherein the source of labile acetyl groups has a molecular weight less than 1000.

25. The method of claim 22 wherein the source of labile acetyl groups has a molecular weight less than 500.

26. The method of claim 22 wherein the source of labile acetyl groups has a molecular weight of between about 100 to about 300.

27. The method of claim 22 wherein the source of labile acetyl groups has a molecular weight approximate that of glyceryl triacetate.